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Financial Intermediation and Growth: Theory and Some Cross-Country Evidence

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Well-functioning financial markets can have a positive effect on economic growth by facilitating savings and more efficient allocation of capital. This paper characterises some of the recent theoretical developments that analyse the relationship between financial intermediation and economic growth and presents empirical estimates based on a model of the linkage between financially intermediated investment and growth for two separate groups of countries, developing and advanced. Empirical estimates for both groups suggest that financial intermediation through the efficiency of investment leads to a higher rate of growth per capita. The relevant coefficient estimates show a higher level of significance for the developing countries. This financial liberalisation in the form of deregulation and establishment and development of stock markets can be expected to lead to enhanced economic growth.

I. INTRODUCTION

After a long period of apparent neglect, the Schumpeterian idea that developed and presumably well-functioning financial markets can positively affect economic growth by facilitating savings and more efficient allocation of capital has come to enjoy new popularity amongst academicians and policy-makers alike. This renewed interest in the idea has spurred a flurry of theoretical work and a few interesting empirical studies both for the developed as well as the developing countries.

Though it may appear as an intuitively appealing idea that the various financial intermediaries such as the money, bond and foreign exchange markets as well as the stock markets should be essential for economic growth since they facilitate mobilisation of savings, efficient allocation of capital, risk management through portfolio diversification and positive inducement for the society to increase its rate of savings, there has been a surprising lack of consensus among economists on the nature of the role of capital markets in economic growth. As a matter of fact, until recently, with the exception of the seminal papers of McKinnon (1973) and Shaw (1973), most economists generally dismissed as secondary at best the potential role of financial intermediaries in promoting economic development. A part of the

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reason for this state of affairs was conceptual—perhaps a lack of rigor in theories linking financial intermediation to growth—and other part empirical since little reliable evidence existed regarding the link between finance and economic growth. However, recent theoretical developments more firmly link finance with steady-state growth [Greenwood and Jovanovic (1990)] and, concurrently, empirical evidence has been accumulating which implies that financial intermediation positively affects economic growth [Goldsmith (1969); King and Levine (1993); Atje and Jovanovic (1993); Gregorio and Guidotti (1995) and Levine (1997)]. A related study of interest is Ratcliffe (1994) which uses the Lucas (1990, 1993) framework to address the issue of why capital does not flow from the rich to the poor countries when rates of return on it differ even after adjustments for degree of financial intermediation, human capital and tax incidence.

On account of the great interest in the recent phenomenon of the emerging stock markets, the issue of the relationship between financial markets and growth and international capital flows has gained an additional measure of importance. Financial deregulation/liberalisation and a tremendous inflow of portfolio investment of the recent past has spurred a phenomenal growth in emerging equities markets, especially in such Asian countries as China, Philippines, and Malaysia. The somewhat disconcerting shocks in the currency markets and ensuing disruptions in economic activity since the summer of 1997 are further evidence that fragility of the financial sector is certainly not neutral in terms of impact on the real sector.

The main purpose of this paper is to characterise some of the recent theoretical developments that analyse the relationship between financial intermediation and economic growth and present empirical estimates based on a model of the linkage between financially intermediated investment and growth. These estimates are provided for a group of Developing Countries as well as a group of Advanced Countries. The rest of the paper is organised such that Section II briefly notes the major functions of the financial markets, Section III outlines a recent model of the relationship between financial sector and growth.[1] Further, Section IV presents empirical estimates and the last section draws some relevant policy conclusions.

II. ROLE OF THE FINANCIAL MARKETS

In general, well-functioning financial markets play many important roles that affect economic growth.

- First, by spreading the risks of long-term investment projects, the growth of the financial markets can lead to a lower cost of equity capital and thereby stimulate investment and growth.

[1]Some of the discussion in this paper relies on an earlier (joint) work of the author; Mariano and Shabbir (1996).

- Second, by acting as a monitor and a facilitator these markets could lead to a greater efficiency of the available investment funds.
- Third, by attracting foreign portfolio capital, developed financial markets can serve to enhance the supply of investable resources particularly in the developing countries. This feature is particularly attractive for highly indebted developing countries whose traditional sources of foreign financing such as grants, and concessional loans are rapidly drying up.
- Fourth, financial markets also play a role in domestic resource mobilisation and the provision of fresh equity capital to the corporate sector. This is particularly important in emerging capital markets where the economy expansion of stock markets is often characterised by an increase in the number of companies going public.

In terms of the Developing Countries, some preliminary useful work already has been done which tries to enumerate the nature of the linkages between financial development and economic growth [see Clemente and Mariano (1993) and Dailami and Atkin (1990)]. However, there is a significant remaining need to generate formal empirical evidence on this question.

III. MODELLING THE RELATIONSHIP BETWEEN FINANCIAL SECTOR AND ECONOMIC GROWTH

(a) Physical Capital, Financial Development, and Economic Growth

Following Atje and Jovanovic (1993), we can formalise the above ideas regarding the effects of financial development and economic growth[2] with the following aggregate production function as a starting point:

$$Y = K \min (L, L^*)^a \qquad a>0 \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (1)$$

where output (Y) is expressed in terms of physical capital (K) and labour (L); and L^* represents labour capacity constraint. At full employment of labour we get the following constant returns to scale production function:

$$Y = K(L)^a = m\,K \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (1')$$

where $m = (L)^a = Y/K$ = output – capital ratio (at full-employment).

The capital accumulation in this economy is given by:

$$K_{t+1} = (1-d)\,K_t + R(F_t)\,I_t \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (2)$$

[2]In fact, much of the discussion in Atje and Jovanovic (1993) uses Greenwood and Jovanovic (1990) as their point of departure.

Here d represents the rate of depreciation of capital stock, I represents investment, F is the level of financial intermediation, and R is a function of F and is meant to formalise the positive impact of financial intermediation on the rate of return on investment. This impact essentially works through improved allocation of investable resources on account of portfolio diversification and informational efficiencies. Atje and Jovanovic (1993) assume $R(\cdot)$ to be an increasing function of F. A more general approach would be to model $R(\cdot)$ more explicitly, starting with a non-monotonic formulation to allow for an empirical test of the monotonicity of R.

Letting $g_x = (X_{t+1} - X_t)/X_t$ i.e. the annual rate of growth of a variable X. Then g_K is given by the following expression:

$$g_K = -d + R(F_t)\ (I_t/K_t) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

$$= -d + R(F_t)\ (Y_t/K_t)(I_t/Y_t)$$

$$= -d + m\,R(F_t)\ z_t \qquad \text{at full-employment}$$

where z_t is the investment-output ratio. At steady state, where output, capital, and labour are growing at the same rate, the growth rate of income per worker is then

$$g_Y - g_L = g_K - g_L = -d - g_L + m\,R(F_t)\,z_t \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Using a first-order Taylor's expansion of R around $F = 0$ gives us

$$R(F_t) \approx R(0) + R'(0)F_t$$

$$g_Y - g_L = -d - g_L + m\,R(0)\,z_t + mR'(0)\,z_t\,F_t \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

One of the major issues of interest is the nature of the financial intermediation index, F, and numerical proxies for it. Though far from representing a consensus, Atje and Jovanovic (1993) considered the following indices (all normalised by GDP):

B = {Credit extended by private and government banks}/ GDP.
F_1 = {Annual value of all stock market trades}/GDP.
F_2 = {Value of stocks outstanding}/GDP.

While each of the above indices can be used by themselves, $(B+F_2)$ can be used as a composite measure of bank loans and value of equity. However adding B

and F_1, is not feasible as former is a stock and the latter is a flow.

In principle, once a decision is made regarding how best to measure F, one needs only to assume that m (inverse of capital output ratio) is invariant across countries to be able to use Equation (5) to estimate cross-country regressions.

Then the following derivative would give the estimated 'importance of finance' in terms of the growth rate of per capita income:

$$\frac{\partial(g_Y - g_L)}{\partial F} = mR'(0)z = \beta z.$$

For an empirical implementation of this model, Equation (5) suggests the regression of $(g_y - g_L)$ on the growth rate of labour (g_L), the investment-output ratio, and the interaction between financial intermediation and the investment-output ratio $(F \cdot z)$.[3]

IV. EMPIRICAL RESULTS

(a) Definition of Variables

Following are the definitions and sources of the major variables used in the empirical estimates for this study.

(i) g_y = Annual growth rate of GDP per capita
(*Source*: International Financial Statistics; IMF).

(ii) F = Measure of Financial Intermediation = $\{(D + E)/K\}$ where
D= Cumulative credit to domestic residents (issued by private and government banks).
(*Source*: International Financial Statistics; IMF).
E= Market Capitalisation of the stock Market or the value of shares outstanding
(*Source*: Datastream and Emerging Markets Fact Book; IFC).

(iii) K = Physical capital Stock in millions of units of the domestic currency
(*Source*: Penn World Tables; Summers and Heston).

(vi) g_L = Annual growth rate of population
(*Source*: International Financial Statistics; IMF).

(v) Z = Investment to Output Ratio
(*Source*: International Financial Statistics; IMF and Penn World Tables).

[3]Atje and Jovanovic (1993) ran regressions of this type, with the following numerical estimates of the impact of financial intermediation on the growth of per capita income:

$$\partial(g_y - g_L)/\partial F \quad \approx \quad .05z.$$

Note that .05 is the estimated coefficient of $F \cdot z$ in the regression of $g_y - g_L$ described above.

(b) Description of the Sample

The estimates are presented for each of the following group of countries separately for the years 1982–92.

(i) *Pooled Sample of the Following Developing Countries*

South Korea, Indonesia, Malaysia, India, Pakistan, Bangladesh, Philippines and Thailand.

(ii) *Pooled Sample of the Following Developed Countries*

U.S., U.K., Canada, Japan, Singapore.

(c) Empirical Estimates and Discussion

The empirical estimates are presented in Table 1, separately for the Developing Countries and the Developed Countries.[4] Overall the estimates are consistent with the model we outlined in the earlier section. The important result is that the coefficient estimate for *ZF* is positive for both the developing as well as the developed countries thus implying that financial intermediation, through efficiency of investment, leads to a higher rate of growth per capita. However, the

Table 1

Growth of GDP Per Capita (*Dep. Var.* = $g_{Y/L}$)

	Pooled Developing Asian Countries			Pooled Developed Countries		
	(1)	(2)	(3)	(1)	(2)	(3)
Constant	0.01	0.02	0.03	0.01	–0.01	0.02
	(0.55)	(0.88)	(1.24)	(0.44)	(–0.41)	(0.35)
g_L	–0.84	–0.77	–0.95	–0.80	–1.16*	–1.12*
	(1.67)	(1.57)	(1.86)	(1.45)	(3.19)	(3.02)
Z	0.26	0.13	0.16	0.35	0.28	0.23
	(1.56)	(0.76)	(0.90)	(1.85)	(1.11)	(0.85)
ZF	0.64*	0.44	0.56*	0.29	0.35	0.36
	(2.62)	(1.74)	(2.07)	(1.05)	(1.10)	(1.09)
Sec. Enrol.			–0.02			–0.02
			(1.20)			(0.51)
$(g_{Y/L})_{-1}$		0.27*	0.24*		0.24	0.23
		(2.43)	(2.14)		(1.71)	(1.62)
N	88	88	88	55	55	55
Adj. R^2	0.24	0.28	0.29	0.21	0.34	0.33

*Significant at 95 percent level (*t*-statistics are given in the parentheses).

[4]This empirical specification is in the spirit of the theoretical model outlined earlier in this paper.

relevant coefficient estimate for the Developing Countries exhibits a relatively higher level of significance than that for the Developed Countries. This may result if for the more Advanced Countries, the simultaneity between financial intermediation and economic growth is relatively more pronounced—an important issue which is not explicitly explored further in this paper.

In any event, it is important to note that the coefficient estimates of *ZF* are robust against inclusion of lagged values of output per capita and secondary school enrollment ratio in the country (see column 2 and column 3 for each of the pooled samples).

In conclusion, the empirical specification estimated in Table 1 implies that the greater degree of financial intermediation leads to higher growth in output per capita.[5]

V. POLICY SIGNIFICANCE AND CONCLUDING REMARKS

Given the relatively strong pro-growth effect of financial intermediation, the clear policy implication is that financial liberalisation in the form of say deregulation and establishment and development of stock markets can be expected to lead to enhanced economic growth. However, an important emerging issue relates to the optimal speed of introducing such financial deregulation is not directly addressed in this paper but is an important element of the agenda for future research related to the important question of the links between financial intermediation and economic growth.

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[5]This result, of course, is subject to the assumptions embedded in the model presented in Section II, in particular, the implicit assumption of lack of simultaneity between financial intermediation and economic growth.

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